REMARKS

Claims 1, 3-11 and 14 are pending.

Claims 15-19 have been withdrawn from consideration.

SPECIFICATION OBJECTION 35 U.S.C. §112

The specification is objected to under 35 U.S.C. 112, first paragraph for failure to provide support for the invention as claimed and for failure to describe the subject matter in a way that reasonably conveys to one skilled in the relevant art that the inventor(s), at the time that the application was filed, had possession of the claimed invention.

Both of these objections relate to terminology in both the specification and claims that attempted to describe the invention using reference to x, y, and z-axes. While the Applicant believes that such descriptions were clear in both the specification and claims, this terminology has now been eliminated from the claims. This objection to the specification, has, therefore, been satisfied by the amended claims.

CLAIMS REJECTIONS – 35 U.S.C. §112

Claims 1, 3-11, and 14 were rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The claims have been rewritten to satisfy the various objections listed in the Second Office Action, most of which related to the attempt to claim the invention using reference to x, y, and z-axes. This method of claiming the invention has been eliminated in the amended claims.

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CLAIMS REJECTIONS – 35 U.S.C. §102

Claims 1 and 3-9 were rejected under 35 U.S.C. 102(b) as being anticipated by Krause, et al (USP 4,281,934). Claim 1 is amended, however, to clarify several features embodied by the present invention. Specifically, claim 1 now clearly states that the connector is a pivotal connector and that the collision surface is connected to the shank at a location spaced apart form the location at which the shank is attached to the central drive shaft. In contrast, Krause teaches and discloses a socket connector rather than a pivotable connector. Moreover, the connector in Krause connects the shank to the central drive shaft rather than connecting a separate collision surface to the shank. Krause therefor lacks at least two elements of the claimed invention.

The above differences between the claimed elements of the present invention and the tool of Krause yield significant advantages for the present invention. Specifically, the claimed invention enables manipulation and orientation of the collision surface along a wide variety of axes rather than simply rotating the collision surface around the axis of the shank. The pivotal connector of the present invention enables another degree of motion not available in the disclosures of Krause. In sum, Krause neither anticipates nor renders obvious the embodiments claimed by Claims 1 and 11 as amended and all those claims that depend therefrom.

Claims 1, 3-9, 11 and 14 were rejected under 35 U.S.C. 102(b) as being anticipated by Jones (USP 739,422). Jones, however, fails to teach a pivotal connector as provided in each of independent claims 1 and 11. Instead, the connector in Jones provides only rotational movement of the collision surface. As a result, the collision profile of collision surfaces in Jones cannot vary in the height dimension as enabled by the claimed invention and as specifically claimed in claims 3 and 22. Thus, Jones does not anticipate the features of the present invention.

Claims 1, 4-9, 11 and 14 were rejected under 35 U.S.C. 102(b) as being anticipated by Austin (USP 3,245,663). The connector mechanism in Austin

shares the same orientation and limitations as the mechanism in Krause. For the same reasons, Austin does not anticipate the features of the present invention.

ELECTION/RESTRICTION

Applicants hereby elect prosecution of Group I, claims 1-14, drawn to a blending tool and a blending machine and withdrawal of Group II, claims 15-19 drawn to a method of making toners, under the restriction requirement.

The application and claims are believed to be in a condition for allowance in their present form and which allowance is respectfully requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case, the Examiner is hereby authorized to call Applicant's Attorney, Richard Spooner, at Telephone Number (585) 423-5324, Rochester, New York.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE:

IN THE SPECIFICATION:

Amended paragraph on page 7, beginning at line 1:

The relevance of the above description of blending tool 16 to the manufacture of electrophotographic, electrostatic or similar toners is demonstrated by the following description of a typical toner manufacturing process. A typical polymer based toner is produced by melt-mixing the heated polymer resin with a pigment in an extruder, such as a Weiner Pfleider ZSK-53™, whereby the pigment is dispersed in the polymer. After the resin has been extruded, the resin mixture is reduced in size by any suitable method including those known in the art. Such reduction is aided by the brittleness of most toners which causes the resin to fracture when impacted. This allows rapid particle size reduction in pulverizers or attritors such as media mills, jet mills, hammer mills, or similar devices. An example of a suitable hammer mill is an Alpine RTM Hammer Mill™. Such a hammer mill is capable of reducing typical toner particles to a size of about 10 microns to about 30 microns. For color toners, toner particle sizes may average within an even smaller range of 4-10 microns.

Amended paragraph on page 7, beginning at line 21:

After classification, the next typical process is a high speed blending process wherein surface additive particles are mixed with the classified toner particles within a high speed blender. These additives include but are not limited to stabilizers, waxes, flow agents, other toners and charge control additives. Specific additives suitable for use in toners include fumed silica, silicon derivatives such as Aerosil.RTM. R972™, available from Degussa, Inc., ferric oxide, hydroxy terminated polyethylenes such as Unilin RTM.™, polyolefin waxes, which preferably are low molecular weight materials, including those with a molecular weight of from about 1,000 to about 20,000, and including polyethylenes and polypropylenes, polymethylmethacrylate, zinc stearate, chromium oxide, aluminum oxide, titanium oxide, stearic acid, and polyvinylidene fluorides such as Kynar™. In aggregate these additives are typically

present in amounts of from about 0.1 to about 1 percent by weight of toner particles. More specifically, zinc stearate shall preferably be present in an amount of from about 0.4 to about 0.6 weight percent. Similar amounts of Aerosi.RTM.™ is preferred. For proper attachment and functionality, typical additive particle sizes range from 5 nanometers to 50 nanometers. Some newer toners require a greater number of additive particles than prior toners as well as a greater proportion of additives in the 25-50 nanometer range. When combined with smaller toner particle sizes required by color toners, the increased size and coverage of additive particles for some color toners creates increased need for high intensity blending.

Amended paragraph on page 12, beginning at line 25:

Accordingly, a blending tool 50 of the present invention is shown in Figure 3 inside of a vessel 10 that is similar to that shown in Figure 1. Center shank 51 contains locking fixture 52 at its middle for mounting onto rotating drive shaft 14 (not shown) of the blending machine 2 (not shown). As shown in Figure 3, an enlarged collision element comprises collision anvil 55 that is proportionately larger than the collision surface of blending tools of the prior art such as that shown in Figure 2. In conventional tools, as discussed above, enlarged collision surfaces are not practical because a large collision surface creates too much "snow plow" compaction in front of the tool and vortices and relative voids in the wake of the tool. To overcome these impediments, a novel feature of the present invention is an enlarged collision element such as collision anvil 55 with cross-sectional perimeters of its leeward surfaces that decrease as such cross-sections are measured closer to the trailing edge of the tool, i.e., its sides and/or top and bottom surfaces tend towards convergence toward the trailing edge. This ["negative slope"] "convexly negatively sloped" of the leeward surface increases intensity since particles that are pushed upward or sideways upon contact with the collision anvil slide along the leeward slope of the tool to fill its wake as the tool slides through the particle mixture. Although the actual movements of particles within a blending machine requires complex 3-dimensional analysis, it is believed that an arcurate shape best

accomplishes the above design since it causes collision anvil 55 to function much like an air foil in a gas fluid. In other words, the particle media through which the blending tool moves acts like a fluid as it is mixed by the tool. As with an air foil, the sloping leeward shape helps minimize voids and turbulence behind the tool. The result is greater particle density available for collision by the next arm of the tool as it sweeps through the blending zone. Greater density of particles leads to greater intensity (collisions/unit of time). Additionally, as noted above, the rounded shape of the leading profile of collision anvil 55 results in more flow of particles over the tool and less "snow plow" compaction in front of the tool. The result is that for the same consumption of power by the blending machine, it is believed that the present invention allows either greater tool speed or a larger collision plate profile. Either greater speed or larger profile result in greater blend intensity.

IN THE CLAIMS:

1) (Amended) An improved blending tool for rotation in a blending machine around a central drive shaft [wherein the plane of rotation defines a z-axis], comprising:

(a) a [center] shank having [an x-axis orthogonal to the z-axis of rotation] a location of attachment to the central drive shaft;

(b) a collision surface having a collision profile; and

(c) a connector mechanism pivotally connecting the collision surface to the [center] shank [in different positions fixed during rotation of the tool such that the collision profile of the collision surface varies with different positions of connection, said connector mechanism having an axis of connection substantially different from both the x-axis and z-axis] at a location spaced apart from the attachment location, wherein pivoting at the connector mechanism varies the collision profile of the collision surface.

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3) (Amended) The blending tool of **claim [1] 22** wherein [the axis of connection is adjustable] pivoting of the collision surface varies the collision profile primarily [along a y-axis defined as the axis orthogonal to the x-axis and the z-axis] in its height dimension.

4) (Amended) The blending tool of **claim 1**, wherein the collision surface comprises a collision plate spaced apart from the [center] shank.

5) (Amended) The blending tool of **claim 4**,

(a) wherein the [center] shank has a first and second end region; and

(b) further comprising at least one collision [plate] surface positioned [in proximity to each] within each end region.

6) (Amended) The blending tool of **claim 4**, further comprising at least one arm having a first and second end wherein the first end of the arm is connected to the [center] shank and the second end is connected to the collision plate.

7) (Amended) The blending tool of **claim 1**, wherein the connector mechanism comprises a fastener that can be unfastened for disconnecting the collision surface from the [center] shank.

8) (Amended) The blending tool of **claim 6**, further comprising a fastener proximate to the first end of the arm, said fastener being capable of unfastening for disconnection of the arm and the collision plate from the [center] shank.

10) (Amended) An improved blending tool for rotation in a blending machine around a central drive shaft [wherein the plane of rotation defines a z-axis], comprising:

(a) a [center] shank having [an x-axis orthogonal to the z-axis of rotation] a location of attachment to the central drive;

(b) a collision surface having a collision profile;

(c) a connector mechanism pivotally connecting the collision surface to the [center] shank, for connecting the collision surface to the [center] shank in one of a plurality of preset positions that are fixed during rotation of the tool such that the collision profile of the collision surface varies with different positions of connection[, said connector mechanism having an axis of connection substantially different from both the x-axis and the y-axis];

(d) at least one arm having a first and second end wherein the first end is connected to the [center] shank and the second end is connected to the collision surface and wherein the arm has a plurality of through holes;

(e) a central hub having a plurality of pre-set positional holes; and

(f) a bolt for rigidly holding the arm in positional relationship to the central hub when said bolt is inserted through the hole in the arm and into an aligned positional hole on the central hub.

11) (Amended) A blending machine, comprising:

(a) a vessel for holding the media to be blended;

(b) a rotatable drive shaft inside of the vessel, for transmitting rotational motion to the blending tool[, wherein the plane of rotation defines a z-axis]; and

(c) a blending tool mounted to the drive shaft inside the vessel, said blending tool comprising a [center] shank having [an x-axis orthogonal to the z-axis of rotation] <u>a location of attachment to the drive shaft</u>, a collision surface having a collision profile, and a connector mechanism <u>pivotally</u> connecting the collision surface to the [center] shank for connecting the collision surface to the [center] shank [in different positions during rotation of the tool such that the collision profile of the collision surface varies with different positions of connection, said connector mechanism having an axis of connection substantially different from both the x-axis and z-axis] <u>at a location spaced apart from the attachment location, wherein pivoting at the connector mechanism varies the collision profile of the collision surface.</u>

Claims 20-22 are new claims.